

**What is claimed is:**

1. A semiconductor device comprising:  
a Schottky layer; and  
a Schottky electrode that is formed on the Schottky layer and  
5 has a Schottky contact with the Schottky layer,  
wherein the Schottky layer is composed of a compound semiconductor including In and P, and  
the portion of the Schottky electrode that touches the  
Schottky layer is composed of material whose main constituents are  
10 La and B.
2. The semiconductor device according to Claim 1,  
wherein the Schottky layer is composed of one of InGaP, InP  
and InAlGaP.
- 15 3. The semiconductor device according to Claim 2,  
wherein the portion of the Schottky electrode that touches  
the Schottky layer is composed of LaB<sub>6</sub>.
- 20 4. The semiconductor device according to Claim 3,  
wherein the semiconductor device is a transistor or a diode.
5. The semiconductor device according to Claim 1,  
wherein the portion of the Schottky electrode that touches  
25 the Schottky layer is composed of LaB<sub>6</sub>.
6. The semiconductor device according to Claim 1,  
wherein the semiconductor device is a transistor or a diode.
- 30 7. A method of manufacturing a semiconductor device that has  
(i) an epitaxial layer that comprises a semiconductor layer and a  
Schottky layer and (ii) a Schottky electrode that is formed on the

Schottky layer and has a Schottky contact with the Schottky layer, the manufacturing method including:

an epitaxial process of forming an epitaxial layer by forming in sequence a semiconductor layer and a Schottky layer that is  
5 composed of a compound semiconductor including In and P on a semi-insulating substrate by epitaxial growth using one of Metal Organic Chemical Vapor Deposition method and Molecular-Beam Epitaxial method; and

an electrode forming process of forming a Schottky electrode  
10 by evaporating material whose main constituents are La and B onto the Schottky layer,

wherein the portion of the Schottky electrode that touches the Schottky layer is composed of the material.

15 8. The method of manufacturing the semiconductor device according to Claim 7,

wherein the Schottky layer is composed of one of InGaP, InP and InAlGaP, and

the Schottky layer is formed in the epitaxial process, the  
20 Schottky layer being composed of one of InGaP, InP and InAlGap.

9. The method of manufacturing the semiconductor device according to Claim 8,

wherein the portion of the Schottky electrode that touches  
25 the Schottky layer is composed of LaB<sub>6</sub>, and

LaB<sub>6</sub> is evaporated onto the Schottky layer in the electrode forming process.

10. The method of manufacturing the semiconductor device  
30 according to Claim 9,

wherein the vapor deposition of the material is performed with an electron-beam vapor deposition method.

11. The method of manufacturing the semiconductor device according to Claim 7,

wherein the portion of the Schottky electrode that touches  
5 the Schottky layer is composed of  $\text{LaB}_6$ , and

$\text{LaB}_6$  is evaporated onto the Schottky layer in the electrode forming process.

12. The method of manufacturing the semiconductor device  
10 according to Claim 7,

wherein the vapor deposition of the material is performed with an electron-beam vapor deposition method.